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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,622	07/03/2001	John G. Apostolopoulos	10012162-1	5149

22879 7590 08/28/2009

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EXAMINER
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HOSSAIN, TANIM M

ART UNIT	PAPER NUMBER
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2445

NOTIFICATION DATE	DELIVERY MODE
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08/28/2009

ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JOHN G. APOSTOLOPOULOS, SUJOY BASU,  
GENE CHEUNG, RAJ KUMAR, SUMIT ROY, BO SHEN,  
WAI-TIAN TAN, SUSIE J.WEE, and TINA WONG

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Appeal 2008-005521  
Application 09/899,622  
Technology Center 2400

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Decided: August 26, 2009

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Before JOHN A. JEFFERY, THU A. DANG, and STEPHEN C. SIU,  
*Administrative Patent Judges.*

JEFFERY, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1, 2, 4-11, and 13-26. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

## STATEMENT OF THE CASE

Appellants invented a system for streaming media data to clients using multiple description bitstreams and various forms of diversity. The invention encodes items of content into multiple bitstreams that are independently decodable from one another. As such, if a decoder receives any single bitstream, it can decode that bitstream to produce a useful signal without needing to access any other bitstream. But if the decoder receives additional bitstreams, it can decode an improved version of the media (i.e., a higher quality version).<sup>1</sup> Claim 1 is illustrative with the key disputed limitation emphasized:

1. A method for streaming media data to a client, said method comprising:

encoding an item of content comprising media data to be streamed to said client into a first multiple description bitstream and into a second multiple description bitstream, wherein said *first multiple description bitstream and said second multiple description bitstream are decodable independent of one another*; and

distributing concurrently said first and second multiple description bitstreams to a plurality of servers placed at intermediate nodes throughout a network, such that said first and second multiple description bitstreams are sent to said client via a plurality of transmission paths, wherein said client decodes said item of content at a first quality should only said first multiple description bitstream be received at said client, wherein said client decodes said item of content at a second quality should only said second multiple description bitstream be received at said client, and wherein said client decodes said item of content at a quality greater than either of said first or second quality should both said first and said second multiple description bitstreams be received at said client.

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<sup>1</sup> See generally Abstract; Spec. 4 and 9; Fig. 2.

The Examiner relies on the following as evidence of unpatentability:

Krueger	US 6,308,222 B1	Oct. 23, 2001 (filed Nov. 30, 1999)
Kroon	US 6,366,888 B1	Apr. 2, 2002 (filed Mar. 29, 1999)
Ehrman	US 2002/0040479 A1	Apr. 4, 2002 (eff. filed Oct. 4, 2000)
Gershman	US 6,401,085 B1	June 4, 2002 (filed Mar. 5, 1999)

Yao Wang et al., *Multiple Description Coding Using Pairwise Correlating Transforms*, 10 IEEE TRANS. ON IMAGE PROC., 2001, at 351-66 (“Wang”).

1. The Examiner rejected claims 1, 2, 4-6, 9, 11, 13-15, and 18 under 35 U.S.C. § 103(a) as unpatentable over Kroon, Wang, and Ehrman. Ans. 3-7.
2. The Examiner rejected claims 7, 8, 10, 16, 17, and 19 under 35 U.S.C. § 103(a) as unpatentable over Kroon, Wang, Ehrman, and Gershman. Ans. 7-8.
3. The Examiner rejected claims 20-22 under 35 U.S.C. § 103(a) as unpatentable over Kroon, Wang, Ehrman, and Krueger. Ans. 8-10.
4. The Examiner rejected claims 23-26 under 35 U.S.C. § 103(a) as unpatentable over Kroon, Wang, Ehrman, Krueger, and Gershman. Ans. 10-12.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer<sup>2</sup> for their respective details. In this decision, we have considered only those arguments actually made by

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<sup>2</sup> Throughout this opinion, we refer to (1) the Appeal Brief filed August 16, 2007; (2) the Examiner’s Answer mailed February 8, 2008; and (3) the Reply Brief filed April 7, 2008.

Appellants. Arguments which Appellants could have made but did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

THE OBVIOUSNESS REJECTION OVER KROON, WANG, AND EHRMAN

Regarding representative claim 1,<sup>3</sup> the Examiner finds that Kroon discloses a method for streaming media data to a client with all the recited subject matter except for (1) the multiple description bitstreams being decodable independent of one another, and (2) the client decodes the content item at first and second qualities if the client receives only the first and second bitstreams, respectively. The Examiner, however, cites Wang as teaching these features in concluding the claim would have been obvious. Ans. 4-5.

The Examiner acknowledges that while Kroon and Wang do not distribute bitstreams to multiple servers throughout a network as claimed, Ehrman nonetheless teaches this feature. Ans. 5.

Appellants argue that there is no suggestion or motivation to combine the references as the Examiner proposes since (1) they teach away from their combination, and (2) combining the references would render them inoperable for their intended purpose. Appellants note that Kroon's system uses (1) a "C-representation" (i.e., representing core audio information) that provides a minimum acceptable quality of the audio when recovered, and (2) "E-representations" that contain enhancement information. Appellants

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<sup>3</sup> Appellants argue claims 1, 2, 4-6, 9, 11, 13-15, and 18 together as a group. *See* App. Br. 9-16. Accordingly, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii).

emphasize that, unlike the C-representation, audio signals recovered based only on the E-representation are not viable. As such, Appellant reasons, only the C-representation is independently decodable—not the E-representations (which must be associated with a C-representation). App. Br. 9-11. Based on this constraint, Appellants contend that combining Kroon with Wang would render Kroon inoperable since the E-representations cannot be decoded independently (i.e., without the C-representation). App. Br. 13-15.

Appellants add that Ehrman does not overcome these shortcomings since distributing different representations at different nodes increases the chances of clients' receiving an E-representation—not a C-representation. App. Br. 13.

The Examiner, however, contends that it would have been obvious to achieve further efficiencies in Kroon's system by not requiring C-representations to recover audio, but instead including different audio representations such their receipt would result in viable audio signals. Ans. 13.

The issues before us, then, are as follows:

#### ISSUES

(1) Under § 103, have Appellants shown that the Examiner erred in rejecting claim 1 by finding that Kroon, Wang, and Ehrman collectively teach or suggest distributing first and second independently decodable multiple description bitstreams via multiple servers as claimed?

(2) Do the cited references teach away from their combination?

(3) Would the Examiner's proposed modification of Kroon render the prior art unsatisfactory for its intended purpose?

#### FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence:

##### *Kroon*

1. Kroon discloses a communications system with multi-rate audio coding that generates subrate representations of each musical piece in server 105 to save memory space. Different combinations of these subrate representations correspond to different connection speeds and audio qualities of the musical piece. Kroon, Abstract; col. 3, ll. 53-58; Fig. 1.

2. In general, the more subrate representations that are communicated to the client, the higher the audio quality of the musical piece. Kroon, col. 3, ll. 58-62.

3. A musical piece has three associated subrate representations. One represents the musical piece's core audio information delivered at a 28.8 kb/sec (kbs) subrate (i.e., a "C-representation"). The other two representations represent first and second enhancement audio information, respectively, and are each delivered at a 36 kbs subrate (i.e., the "E<sub>1</sub>-representation" and "E<sub>2</sub>-representation"). Storing these subrate representations in the server thus precludes the need to store higher rate versions of the musical piece. Kroon, col. 2, ll. 5-11; col. 3, l. 62 – col. 4, l. 4; col. 4, ll. 33-40.

4. Recovering the signal based on the C-representation alone provides a minimally-acceptable 28.8 kbs signal quality. But recovering the signal based on the C-representation combined with either the E<sub>1</sub>- or E<sub>2</sub>-representations provides a higher 64 kbs signal quality. And recovering the signal based the C-representation combined with both the E<sub>1</sub>- and E<sub>2</sub>-representations provides the highest 100 kbs signal quality. Kroon, col. 2, ll. 11-21; col. 4, ll. 4-14. The characteristics of these recovered signals are summarized below:

Basis for Signal Recovery	Bit Rate (kbs)	Quality
C-representation only	28.8	Minimum acceptable
C-representation with either E <sub>1</sub> - or E <sub>2</sub> -representations	64	Higher
C-representation with both E <sub>1</sub> - and E <sub>2</sub> -representations	100	Highest

Table 1: Summary of Characteristics of Signals Recovered in Kroon

5. Any audio signals recovered based only on the E<sub>1</sub>-representation and/or the E<sub>2</sub>-representation are not viable. Kroon, col. 4, ll. 14-16.

6. Server 105 may implement path diversity by routing streams of packets containing equivalent amounts of audio information through different paths to the same client. Kroon, col. 9, ll. 45-65.



*Wang*

7. Wang discloses a multiple description coding scheme that encodes a source into multiple bitstreams supporting multiple levels of decoding. In particular, Wang describes a two-description case where (1) a high-quality reconstruction is decodable from the two bitstreams together, and (2) a lower, acceptable quality reconstruction is decodable from either of the two individual bitstreams. Wang, at 351 (Abstract and Introduction).

*Ehrman*

8. Ehrman discloses a streaming content system (e.g., for video content). Specifically, multiple streams are provided to “supplying peers” 10, each with associated suppliers 11. Each supplier separately streams data to a receiving peer 12 via network 16, and the receiving peer recombines the received streams into a single stream of content. Ehrman, Abstract; ¶¶ 0016-23; Fig. 1.

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). If the Examiner’s burden is met, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006) (citations and internal quotation marks omitted).

If the Examiner’s proposed modification renders the prior art unsatisfactory for its intended purpose, the Examiner has failed to make a *prima facie* case of obviousness. *See In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984).

#### ANALYSIS

The dispute before us hinges on whether the cited prior art collectively teaches or suggests independently decodable multiple description bitstreams as recited in claim 1, and whether the references are reasonably combinable. For the following reasons, we find no error in Examiner’s combination of references to arrive at the claimed invention.

Kroon does require the C-representation to recover an audio signal with minimally-acceptable quality (28.8 kbps). FF 3-4. And we recognize that recovering audio signals based solely on one or both E-representations is not viable. FF 5. Put another way, audio signals with E-representations require the C-representation, but not vice-versa. *See* FF 4-5.

Nevertheless, nothing in the claim precludes the recited first and second multiple description bitstreams as including not only a bitstream consisting solely of a C-representation bitstream, but also bitstreams with C- and E-representations. *See* FF 4. That is, we see no reason why the various

bitstreams in Kroon are not independently decodable, particularly since they are independently recoverable to produce audio content of varying quality depending on the particular bitstream as indicated in Table 1. *See id.*

Indeed, as that table indicates, Kroon contemplates four different bitstreams (*see id.*) summarized below:

Bitstream	Signal Recovery Basis	Bit Rate (kbs)	Quality
1	C-representation only	28.8	Minimum acceptable
2	C-representation with E <sub>1</sub> -representation	64	Higher
3	C-representation with E <sub>2</sub> -representation	64	Higher (same as above)
4	C-representation with both E <sub>1</sub> - and E <sub>2</sub> -representations	100	Highest

Table 2: Summary of Bitstreams Based on Signals Recovered in Kroon

Based on these respective bitstreams, we see no reason why the recited first and second bitstreams in claim 1 could not constitute Bitstreams (1), (2), or (3) in Table 2 above. In that case, not only would these bitstreams be independently decodable, but such a scheme also fully meets the recited conditions in the claim.

For example, if the first recited bitstream corresponds to Bitstream (2) in Table 2 ( $C + E_1$  representation), and the second recited bitstream corresponds to Bitstream (3) ( $C + E_2$  representation), then the item of content would be decoded at 64 kbps if only one of these bitstreams is received (i.e., the item is decoded at a first or second quality as claimed). *See* FF 4. Notably, nothing in the claim requires that the first and second qualities be different. And if both of these bitstreams are received, then Kroon reasonably suggests recovering the signal based on the C-representation with both  $E_1$  and  $E_2$  representations (i.e.,  $C + E_1 + E_2$  representations) at a quality higher than the first and second qualities (i.e., 100 kbs). *See id.*

In short, nothing on this record precludes a multiple description bitstream from including C- and E-representations. To this extent, we agree with the Examiner (Ans. 13) that a C-representation alone is not required to recover viable audio signals. Although Kroon utilizes the C-representation as a basis for each type of recovery (FF 4), it is nonetheless used with the E-representations in connection with different bitstreams as noted above.

And even if we assume, without deciding, that decoding bitstreams other than one based solely on a C-representation introduces some inefficiencies as Appellants contend (Reply Br. 1-2), skilled artisans would recognize that such a drawback could be offset by, among other things, the increased audio quality resulting from the recovered signal. Such an engineering tradeoff is a decision well within the level of skilled artisans.

As such, we see no error in the Examiner's combining Kroon with Wang and Ehrman to arrive at the claimed invention. Wang teaches a multiple description coding scheme where (1) a high-quality reconstruction is decodable from the two bitstreams together, and (2) a lower, acceptable

quality reconstruction is decodable from either of the two individual bitstreams. FF 7. As such, we see no reason why these respective bitstreams in Wang could not include both C- and E-representations as noted above. In that case, we see no reason why these bitstreams would not be independently decodable as claimed.

Accordingly, we do not find that the cited references teach away from their combination since we see no reason why a skilled artisan would be discouraged from following the path set out in the references, or would be led in a direction divergent from the path that was taken by the Appellants. *See Kahn*, 441 F.3d at 990. Nor do we find that the Examiner's proposed combination renders the prior art unsatisfactory for its intended purpose for the reasons noted above. *See Gordon*, 733 F.2d at 902.

We reach a similar conclusion with respect to the Examiner's combining Ehrman with Kroon and Wang to arrive at the claimed invention. Ehrman uses multiple servers to separately stream data to a "receiving peer" via a network, and the receiving peer recombines the received streams into a single stream of content. FF 8. We see no reason why such a technique could not be used in connection with the bitstreams of the Kroon/Wang combination noted above, particularly since Kroon expressly contemplates using path diversity by routing streams of routing streams of packets containing equivalent amounts of audio information through different paths to the same client. *See* FF 6.

Appellants' contention that distributing different representations at different nodes increases the chances of clients' receiving an E-representation, and not a C-representation (App. Br. 13) is merely speculative without evidentiary support. But even if we assume, without

deciding, that one bitstream could somehow be more likely to be received than another, the respective bitstreams in Kroon can reasonably constitute both C- and E-representations. As such, providing multiple distribution servers as suggested by Ehrman would not defeat the purpose of Kroon, but would actually enhance the integrity of the system since it would, at a minimum, provide path diversity in distributing the content. *See* FF 6 and 8. That Kroon contemplates using path diversity (FF 8) only bolsters this conclusion.

We therefore find the Examiner's reason to combine the teachings of the cited references supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion.

For the foregoing reasons, Appellants have not persuaded us of error in the Examiner's rejection of representative claim 1. Therefore, we will sustain the Examiner's rejection of that claim, and claims 2, 4-6, 9, 11, 13-15, and 18 which fall with claim 1.

#### THE OTHER OBVIOUSNESS REJECTIONS

Likewise, we will sustain the Examiner's obviousness rejections of (1) claims 7, 8, 10, 16, 17, and 19 over Kroon, Wang, Ehrman, and Gershman; (2) claims 20-22 over Kroon, Wang, Ehrman, and Krueger; and (3) claims 23-26 over Kroon, Wang, Ehrman, Krueger, and Gershman. Although Appellant nominally argues these rejections separately, Appellant essentially reiterates the same arguments made with respect to the alleged deficiencies in combining Kroon, Wang, and Ehrman noted above in connection with claim 1, and that the cited additional references to Gershman and Krueger fail to cure these deficiencies. *See* App. Br. 16-40.

We are not persuaded by these arguments, however, for the reasons previously discussed. Nor have Appellants particularly pointed out errors in the Examiner's reliance on Gershman and Krueger for the additionally claimed features to persuasively rebut the Examiner's prima facie case of obviousness. Thus, we are not persuaded of error in the Examiner's rejections of (1) claims 7, 8, 10, 16, 17, and 19; (2) claims 20-22; and (3) claims 23-26 for the same reasons discussed above with respect to claim 1. The rejections are therefore sustained.

#### CONCLUSION

Appellants have not shown that the Examiner erred in rejecting claims 1, 2, 4-11, and 13-26 under § 103.

#### ORDER

The Examiner's decision rejecting claims 1, 2, 4-11, and 13-26 is affirmed.

Appeal 2008-005521  
Application 09/899,622

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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